

THE
ARCHIVES OF PEDIATRICS.

VOL. VII.]

APRIL, 1890.

[No. 4.

Original Communications.

**ADHERENT VESICAL CALCULUS IN A CHILD.—
CLINICAL HISTORY AND GENERAL STUDY
OF THE QUESTION.**

BY A. MARTINEZ VARGAS, M.D.,

Professor of Diseases of Children in the University of Granada, Founder and
Chief of the Pado-Clinic Faculty.

Two great problems, one diagnostic the other surgical, clearly prove the clinical history of this case, showing the incrustation of a calculus in the mucous membrane of the bladder,—a fact denied by eminent medical writers,—demonstrated beyond a doubt after the operation by the marks covering almost one-third of the calculus; and, after its extraction, on exploring with the finger, and feeling at the point of adherence the remaining grains of sand still remaining incrustated in the mucous membrane; and therefore, on account of the conditions of the structure of this stone, a new theory can be founded upon its formation, and one which, I believe, will set at rest the doubts as to the advisability of operating by lithotomy, in opposition to the theory so warmly recommended by surgeons advocating, in all cases, the operation of lithotripsy, a shoal upon which the arguments of so many surgeons foundered who prefer the latter method of operating.

Such is the study which I wish to present, in accordance with the wishes of the editor of the ARCHIVES OF PEDIA-

TRICS, from whom I receive unmerited honor in being allowed to sign my name in so world-famed a journal.

History of the case.—Child, T. Muñoz, aged three years and three months. At his birth he had slight asphyxia. The family changed their residence three times during the first four, five, and fifteen months after birth, the child suffering in the first two changes serious diarrhoea. In each of these three villages the waters were charged with salts, and frequent cases of stone diseases are to be found there. Teething of a trying character commenced at seven months of age. At fifteen months was vaccinated; at sixteen months weaned, when the mother was already one month gone with child. Then suffered with a very bad diarrhoea. At twenty-six months the child had a slight attack of convulsions, caused by worms (?). In April, 1888, when two years old, he must have felt the first pains in the hypogastric region and the penis, for at the time of making water it caused him to cry bitterly. Generally the urine passed naturally,—sometimes only in drops; but never under any circumstances was the micturition suspended entirely. The pains were always present during the process of making water, and they were so severe that these efforts caused the child to bleed from the ears. The water was never mixed with blood. The teeth commenced to fall. From the first pains the child was visited by three doctors and a quack (*curandero*). The quack visited him for a considerable time, during which time he gave him an enormous number of infusions of boiled herbs, which increased the quantity of the water, and he also gave him hypogastric ointments.

The 11th of last June the child was brought to my pædo-clinic; it was by no means emaciated, but had great weakness in the legs; the end of the penis was enlarged, and indications of prolapsus recti were present. I administered chloroform, and scarcely had the catheter entered into the bladder when I felt the presence of a stone on the left side, and could only find it there in all subsequent explorations, and at the moment of performing the operation.

Operation.—With all the usual precautions, I performed lithotomy on the 13th of June, assisted by Dr. T. Timenez

and three medical students. Upon entering the bladder, I introduced the first finger of the left hand, in order to examine the bladder and touch the stone, the left side being quite free from encystment; afterwards I put in the forceps in order to extract the stone, and encountered resistance in its extraction. Suspecting that I might have caught the mucous membrane as well as the stone, I introduced again the finger, and as the bladder was contracted around the stone, I could not ascertain the state of the hinder part, but I observed that the greater part of the stone was separated from the bladder. I caught the stone for the second time, convinced now that I had not taken hold of the mucous membrane, and drew firmly twice, and succeeded in taking out the stone. Without stopping to examine it, I probed with my finger the vesical cavity, and was very much surprised, on touching the left side of the bladder, where I had always found the stone, to find a roughness in a small portion of this spot, as if grains of sand had been stuck on. I begged of those present to be kind enough to do as I had done. They did so, and all agreed in my opinion. Immediately afterwards I examined the stone, and I observed that one of the extremities of the outer part was rugged and a little sunken, quite different from the remainder of the stone, with unequal projections, showing certainly the point at which it had been detached from its adherence.

By these marks, and by the grains of sand that were adhering to the bladder, I judged that the resistance which I encountered in extracting the stone was in consequence of this adhesion. With the tip of the finger I separated the loose grains. I did not wish to drag them all out, lest hemorrhage might be produced, and open another wound to the infection. I washed the bladder with boric acid solution, at four per cent., and I left the Guyon sound in, in order to secure the discharge and avoid the hemorrhage. In the afternoon the water came out slightly colored. I gave the child a mixture of bromide of camphor and benzoate of sodium.

First day (14th of June).—Temperature 38° centigrade. Bilious vomiting in the morning.

Afternoon.—The abdomen swollen, painful, and tympanitic; applied belladonna and mercury ointments, also linseed poult-

tice; removed drainage-tube. Injection of boric solution every three hours.

Second day.—The urine flows through the urethra.

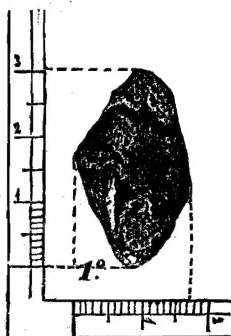
Third day (16th).—The symptoms of peritonitis subside.

June 25.—Cured. The wound completely cicatrized. The child does not complain in the least. I prescribed the mixture of bromide of camphor and benzoate of sodium and ointments of turpentine from time to time in the region of the kidneys.

September 15.—According to the father's letter, the patient is quite well, and, "catching the penis, laughs gladly at seeing the water rush out freely without pain."

Description of the stone.—(Vide the engravings made in the natural size, by T. Espina.) *Shape:* Nearly oval, although at both ends rather pointed. *Surface:* Is not uniform. I can say that it consists of two principal parts, the central portion and the two pointed extremities; the former is uniformly not smooth, slightly rough, and resembles very much *chagrin*; it is chocolate color; the extremities, as can be seen by the engraving No. 1, presents the aspect of inlaid pieces of distinct

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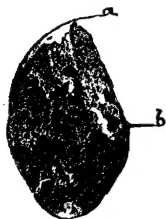


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the outer part is rugged, something like sand, with little crystal pebbles the color of loaf sugar.

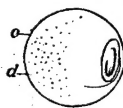
From the upper point to the central part can be seen (in the engraving No. 2, *a*, *b*) an elliptic surface with unequal bottom,

FIG. 2.



2°

FIG. 3.



full of sharp points, which denote that here it had suffered a violent pull. This excavation measures more than the half of the length of the entire stone,—seventeen millimetres in its longitudinal diameter and six in its transversal. *Size*: As the scale was put at the sides of the stone (see engraving No. 1) it indicates the vertical diameter to be three centimetres, and the transversal seventeen millimetres. *Weight*: Three months after its extraction,—that is to say, in dry state,—the stone weighed 4.95 grammes. *Nucleus*: I cut through the stone with some difficulty because it cracked into pieces at the beginning. I found a nucleus outside of the centre; this one is oval, as can be seen in the engraving No. 4, and is composed of concentric strata, which are very few and very slight. The remainder of the nucleus the same as the surface; the rest of the stone is of a uniform appearance,—ash color. The nucleus measures seven millimetres in length by four and a half in breadth, so that it occupies the third part of the entire size of the entire section of the stone. It is immediately below the surface in the point opposite to the excavation, which I encountered adherent to the bladder, *c* and *d*. *Composition*: I did not make the analysis according to the plan of Ebstein,*

* "Die natur und Behandlung d. Harnsteines," Wiesbaden: Bergmann, 1884.

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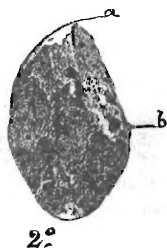
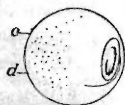


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nor that of Laebish, modified by Keyes,* but by the more simple one of Posner†. I examined the dust through the microscope with Dr. Mendoza, chief of the microbiological laboratory of the hospital of San Juan de Dios, and submitted it to chlorhydric and acetic acids, etc. The result proves

FIG. 4.



that the nucleus is composed of urate of sodium and, above all, of urate of ammonium, and the remainder of the stone of carbonate and phosphate of lime with something of oxalate.

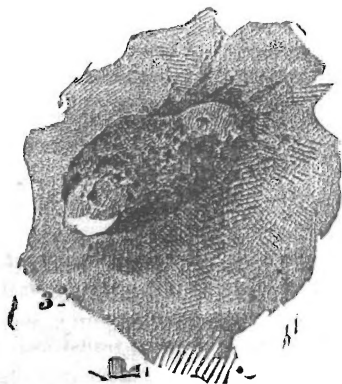
Importance of the case.—The resistance which I met with in the extraction of the stone, the little grains of sand which we have touched, and which were so firmly embedded in the bladder, and the hollow perceived in the stone (see engraving, which is an exact reproduction of it) proves beyond all doubt the fact of the adherence of urinal stones to the mucous membrane of the bladder. The conditions under which I have been able to study this case give to it an evident and demonstrative value which render it superior to those given in surgical literature. In the future there shall be no excuse for these omissions among medical authors regarding the adherence

* "Cálculos Urinarios," por E. L. Keyes; en "Enciclopedia Internacional de Cirugia," del Dr. Ashhurst. Version española. Madrid, 1888. Tomo viii. p. 136.

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of the stone, as, until now, these authors have only spoken of the loose or encysted calculi (*enchatonnés*). Neither can one admit the ambiguous phrases of Dr. Keyes,* one of the most modern and important authors on this matter, when, in relation to the adherence of the stones, he says, "Undoubtedly this hypothesis proceeds from the difficulties which present themselves at extracting a stone, and, above all, when one of its rugged sides becomes covered with coagulated blood." Reginald Harrison only mentions, in relation to this question, that he saw a case "where one of the spikes of an oxalate stone was so embedded in the wall of the bladder."† Even Alfred Pousson‡ expresses great doubt in relation to the adherence of calculi, although he does not deny the possibility of their existence.

Besides this first demonstration of the existence of adherent stones, deducted from the study of the case, we have to encounter others not less important because they are germs of practical application, without which one might say that this case is not more than a surgical eccentricity, but in many ways an interesting study.

I have said already, the difficulties in the extraction of the stone and the commencement of peritonitis, after the operation, on account of stretching or tearing of the peritoneum, prove clearly, *a posteriori*, that this was not the best manner of proceeding in order to extract such stone nor the least dangerous, as in the other two operations that I had performed previously this season, for children of the same age and the same treatment, I did not observe these difficulties nor these consequences.

In the interest of science we shall explain these points.

Relative frequency of adherent stones.—I have collected the principal statistics of vesical stones, as can be seen by the following table.

* Loc. cit., p. 150.

† "Lectures on the Surgical Disorders of the Urinary Organs," London, 1887, p. 434, Fig. 69.

‡ "Encyclop. Internat. de Chirurgie. Chirurgie des Organes Génito-Urinaires de l'Homme et de la Femme," Paris, 1888. Art. "Calculs Urinaires," p. 256.

Statistics of Calculi.

No.	COLLECTION OF	Number of Calculi.	OPERATED BY		
			Lith- otri- try.	Perineal	Supra- pubic.
1	Hunter (Museum of)	649	..	..	..
2	Leroy d'Etiolle	1100	..	..	..
3	Guy (Museum of the Hospital)	374	..	..	..
4	Ullmann	645	..	..	..
5	Dalles	..	..	..	636
6	Quoted by Keyes, <i>loc. cit.</i>	..	..	..	..
7	Freudenberg (drainage of the bladder, etc., <i>Berliner Klinische Wochenschrift</i> , 1881, No. 1)	..	..	..	8
8	H. Thompson (two years), p. 279	103	92	11	..
9	Browne (quoted by Thompson)	..	13	..	..
10	T. Bigelow (p. 292)	..	45	..	..
11	Buchanan (p. 312)	85	..	..	..
12	Spence (p. 314)	..	4	..	..
13	Gross (List of American and European), "System of Surgery," 6th ed., 1882, vol. ii, p. 736	..	..	5014	..
14	Kuriado, Thesis Mexico, 1888	..	..	6	..
15	Brockel (quoted by Garcin, <i>Contrib. Clin.</i> , etc., Strasbourg, 1884)	..	..	..	5
16	König	..	..	..	5
17	Merevkin (quoted by König)	..	..	22	..
18	Tufter	..	11	140	120
19	Zinzin (quoted by Ebermann)	38	..	..	..
20	Bergmann	..	..	..	..
21	Volkmann	..	..	..	..
22	Gussebauer	..	..	..	..
23	Villalobos, <i>Gaceta Médica de México</i> , 1887, p. 522	53	25	100	18
24	Guyon, <i>Revue de Chirurgie</i> , 1887	..	..	10	..
25	H. Thompson, <i>Brit. Med. Journ.</i> , 1887	43	..	25	307
26	Freyer, <i>Lancet</i> , 1887	203	..	87	11
27	Flury, <i>Ein Beitrag</i>, ..	..	..	..	92
28	Broussin	..	..	..	14
29	Garcin	..	..	..	94
30	Bereskin, <i>Central. J. Kinderh.</i> , May 2, 1887	..	..	..	59
31	Keegan, <i>New York Med. Jour.</i> , September 22, 1888	..	114*	132*	..
32	Jackson, <i>Lancet</i> , August 24, 1889, p. 367	..	108	..	..
33	Suender (conversation)	..	18	..	..
34	Settler	..	..	..	..
35	Several Spanish surgeons	..	..	..	..
36	Medicine Faculty of Madrid (collection)	..	..	..	..
37	" Revueltas-Carrillo (collection)	70	..	..	21
38	" Creus (collection)	60	..	30	..
39	Martinez Vargas, season of 1888-89	..	..	3	..
		3323	430 +	5637 +	1410
					7477

* Children.

After having looked over the table the adherence of the stones appears strange; however, these statistics are not infallible; although I have tried to find in them indications treating of adherence, I have not found them. I think this is due to the indifference, probably, with which the surgeons have regarded this subject, considered as a freak of nature.* Therefore it is that they have not noted it in their statistical observations and operations. I think the time has come in which it is necessary to call attention to this matter, and that in the future we shall find cases of this kind more frequent. It is indispensable to open a chapter on the subject of the urinary pathology of children.

History of adherent calculi.—The admittance of the adherence of stones to the bladder is of recent date, although urinal calculi are mentioned in the Indian work entitled “*Sucruta*,” written, according to the belief of many, previous to Hippocrates, who positively studied them and mentioned them as follows: “*In quorum urinis arenosa subsistunt it vexica laborat cálculo.*”† Nevertheless, the first book which treats of the adherence of calculi is that of my fellow-countryman, Francisco Diaz,‡ a physician of the sixteenth century, who observed, in two cases, after autopsy, the choking of the ureter by stones and the great size they had attained. At the beginning of this century, Leroy d’Etiolle§ says, “*Calculi*

* Dr. F. Rubio has told me that Dr. Benjumeda, of Cadiz, in conversation with his students, recommended very earnestly their attention to the probabilities of adherence, stating that he had been obliged to leave an operation unfinished on this account.

† Aphor., lib. 4, sent. 79.

‡ . . . “Y es porque como alguna vez cac la piedra de los riñones se suele quedar antes de entrar en el hueco de la vejiga, y alli va creciendo cada dia, y estas Uegan á tanta grandeza que yo he visto abrir á algunos y hallarla del peso de ocho y mas onzas, porque como alli el artifice no puede Uegar dice que no tienc piedra, por ESTAR TAN FIJA NO SE PUEDE MENEAR. . . y cierto que desto que digo yo he visto dos casos. . . . Tratado nuevamente impreso de todas las enfermedades de los riñones vexiga y carnosidad es de la verga y urina compuesto por Francisco Diaz, Madrid, 1588. Yn Noticia de las obras del Dr. Francisco Diaz célebre médico español del siglo XVI. por el Dr. E. Suender, Madrid, 1888, p. 32.”

§ “Exposicion de diversas operaciones hechas hasta ahora para curar el mal de piedra sin recurrir á la operacion de la talla.” Version española, del francés (Paris, 1825), Madrid, 1828, p. 47.

embedded or encysted may be the cause of adherences to the mucous membrane. Desormeaux,* expounding the merits of his endoscopy, claims that only by means of this instrument the presence of adherent calculi can be detected. Chelius, professor of Heidelberg, in his masterly studies,† speaks also of adherence; Madrazo‡ affirms that sometimes calculi are to be found incrustated in the internal lining of the bladder, near its neck, and in the examination of the bladder, on account of the grating sensation felt (phosphatic concretions), mistakes may easily be made, often no stone being present. Finally, Keyes mentions several cases, particularly one of his own.§

But few writers mention adherent calculi, and if they do, none have made special study of the subject.

Among these few historical facts that I have found a distinction must be made between embedded calculi and mineral incrustations in the mucous lining of the bladder.

My friend, Dr. Suender, has observed, in his prohibitive practice, three cases of chronic cystitis with all the rational indications of calculi, but on after-examination no stone was to be found; and, in the belief that it was a case of cystitis, he injected iodoform, which caused the patients to expel numerous phosphatic scales, and in one of these cases—that of a man sixty years of age—the scales passed numbered over two hundred. Dr. Suender has been kind enough to show them to me, and I found that they bear a great resemblance to the fragments of hemp-seeds. Nevertheless, these incrustations may be the origin of a stone previous to there attaining bulk, and therefore need not be studied. The same can be said of encysted calculi (*enchatonnés*).

The following is the list of all cases I have been able to collect, with the exception of the two cases spoken of by Diaz, in which the stones, on leaving the kidneys, were detained in the vesical orifice of the ureter without passing into the blad-

* "De l'endoscope et de ses applications au diagnostic et au traitement des affections de l'urethre et de la vessie," Paris, 1865, p. 175.

† "Tratado Completo de Cirugia," traduccion de la cuarta y última edicion alemana. Anotado y adicionado, Madrid, 1870, tomo ii. p. 272.

‡ "Lecciones en la Facultad de Medicina de Barcelona." Revista de Ciencias Médicas de Barcelona, 1887, p. 500.

§ Loc. cit., p. 150.

der, and there remaining fixed, increased in volume without adhesion.

Pathology.—It appears strange that so young a child should have an adherent stone, and it is still stranger that this phenomenon exists, particularly as the child felt the first pains only one year previous to diagnosis of stone in the bladder.

This adherence might be accounted for if the child had encysted stone with constant irritation which might have produced the adherence as a natural sequence. I found in the bladder of this little patient no cellular cavities nor other deformities.

I do not find, with the exception of works of Chelius and Keyes, any author who explains this process. The explanations given by Chelius, the first belonging to Francisco Diaz, are very ambiguous, and they are confounded with the doctrine of encystment. Within the hypothesis, which relates to this, I find worthy of mention the following :

(a) The stone, on passing from the kidney, is detained in the vesical orifice of the ureter, and it is fixed in the membrane, where it continues to develop.

(b) The irritation produced by the stone, and the consequent inflammation, can engender a plastic exudation that forms a pseudo-membrane around the stone.*

(c) A hypertrophic bladder brings one of its numerous pockets against the inequalities of a stone. The precipitation of the urinal salts take place or are increased in the stone points where this is not in immediate contact in such a manner that they form as heads like those of nails between the stone and the columns of the bladder.†

(d) Upon an ulcerated part of the mucous membrane are formed crystal incrustations which are intermixed with long granulations.

(e) The contact of a sharp stone can irritate the mucous membrane to such a degree as to form granulations, which introduce themselves between the inequalities of the stone.‡

* Chelius, p. 272.

† Nelaton, "Elem. de Path. Chir.," Paris, 1884, vol. vi. p. 67.

‡ Keyes, p. 150.

Table of Twenty-three Cases of Adherent Stones.

No.	OBSERVER.	ANTECEDENTS OF THE CASE.	CONDITIONS OF THE STONE.
1	Toset Rives. Collection of stones existing in the School of Medicine of Madrid, No. 360, Catalog.	Stone extracted from the bladder of a boy, sixteen years of age, in May 21, 1821.	The stone was adherent and the point of adherence is perfectly seen.
2	Duyutren (Museum) show case 62, No. 34.	Specimen presented by Leroy d'Etolle.	Case of adherence.
3	<i>Medical Times and Gazette</i> , vol. ix, p. 523, 1854.	Post-mortem examination in Necker Hospital, Civiale found a calculus of phosphates three-quarters of an inch that had produced an ulceration in the base of the bladder.	Adherent to the muscular cutting after ulceration of the mucous membrane.
4	Nunn. <i>Med. Times and Gaz.</i> , vol. ix, p. 523, 1854.	After death. Behind the prostate a calculus was found, size of a nutmeg, composed of uric acid and phosphates.	Case of adherence.
5	Van der Byl. <i>Transact. Pathol. Soc. of London</i> , vol. i, p. 236, 1857.	A woman, aged fifty years, who died of uterine and ovarian cancer in Middlesex Hospital without symptoms of calculus. Post-mortem examination showed presence of a plate of phosphate and oxalate of lime an inch from the urethra in the base of the bladder.	Smooth, plate, half an inch diameter, held in place by granulations of the internal lining of the bladder.
6	Tarjavey. (Quoted by Desormeaux), with a chromo-lithograph, Plate 3, No. 9).	A man, Hospital of Saint Antoine, with the catheter, suspected presence, Desormeaux found with the endoscope as well a point of injury caused by attempts to perform lithotomy.	Adhered by its left extremity, the mucous membrane surrounding in form of a ring.
7	Houel. (Quoted by Desormeaux), p. 176.	A man, aged fifty-eight years, suffered from hematuria, at times without sudden interruption of the micturition nor severe pains at the base of the gland. Desormeaux discovered presence of a calculus with the endoscope.	After death, found calculus adherent to the bladder.
8	G. Morton. <i>Penna. Hosp. Reports</i> , 49, 1859. Keyes, p. 150.	Case of lithotomy (?). Discovered presence of a phosphatic calculus weighing one hundred and sixty-five grammes.	Adherent to the base of the bladder by a pedicle.
9	Thompson. <i>Transact. of the Pathological Soc. of London</i> , vol. vi, p. 220. <i>Traité Prat. des Mal. des Voies Urin.</i> , Paris, 1814, p. 627.	Male, aged sixty years. Amphitheatre of Middlesex Hospital. Three stones found in the bladder; two adherent.	In the calcareous mass fibres of infamucous tissue was embedded.
10	Henry. (Quoted by Thompson).	On operation of lithotomy found a stone, unusual size, adherent to the vertex of the bladder.	On careful examination of the stone at one of its extremities a membrane of new formation was to be seen.

11	Keyes, <i>loc. cit.</i> , p. 150.	Male patient. Performed lithotomy, and extracted a phosphatic calculus, encountering great resistance, being obliged to remove a slab in the posterior part of the bladder by scraping it.	Slab, mixed granulations.
12	Candela. <i>Siglo Médico</i> , 1886, p. 540.	Female, aged sixty years. Exploration with the catheter showed presence of stone always at the same point and immovable. An attack of acute pain caused spontaneous ejection of the stone covered with blood and pus.	Calculus with a spike. At one of its extremities, one of which very rough, suspicious point of adherence.
13	Monchet. <i>Rev. de Chirurgie</i> , February 10, 1887, p. 148.	(a) Male, aged twenty-one years. Numerous prostatic and vesical calculi.	Stone firmly attached. Death on the third day, caused by vesical ulcerations and peritonitis.
14	The same.	(b) Suprapubic lithotomy. Vesical calculus.	Adherent.
15	Buckston Browne. <i>Clinical Soc. of London</i> , November 10, 1888. <i>Lancet</i> , November 17, p. 975.	Gentleman, aged sixty-eight years. Lithotripsy performed five times in two years, from August, 1886, to April, 1888. The sound showed presence of stone resting upon the neck of the bladder. The vesical cavity appeared free from calculus. Suprapubic lithotomy. Phosphatic calculus. Weighed a quarter of an ounce.	The stone was evidently implanted in the base of the bladder behind the prostate.
16	Reginald Harrison, <i>loc. cit.</i> , p. 422, Fig. 69.	A stone of oxalate of lime and with many prolongations.	One of the points incrustrated in the wall of the bladder.
17	Mariani, <i>Siglo Médico</i> , June 2, 1899, p. 338.	Male, aged twenty-eight years. 1886. Lithotripsy attempted. Lithotomy.	Calculus very strongly adherent at the bottom of the bladder.
18	Creus. Letter from the author.	(a) A child. Perineal lithotomy. Difficult extraction of stone.	Large and very adherent calculus.
19	The same.	(b) A child. Perineal lithotomy. A stone difficult to extract.	Large and very adherent calculus.
20	Federico Rubio. (Conversation.)	(a) A child. Calculus hour-glass shape. Perineal lithotomy.	Adherent and encysted.
21	The same.	(b) Male. A stone.	Adherent.
22	The same.	(c) Old man. Pebble-shaped stone, seven centimetres long, three broad, and one thick at the centre.	Firmly adhered, causing necessarily to scrape the bladder.
23	Losada. (Conversation.)	Child, aged nine years. Perineal lithotomy. Phosphatic calculus embedded immediately underneath the entrance of the urethra in a manner that at times it was able to obstruct the canal of the urethra and produce retention.	Stone incrustrated in the mucous membrane, and besides this a covering was forming as a ring around the stone.

In the stone of my patient I did not find marks of granulations even at the time of extraction. The surface of the adherence had not the least vestige of granulated tissue; consequently it appeared that the union between the stone and the mucous membrane had taken place by means of the incrustation of the superficial grains between the cells of the vesical tissue.

The examination of the section of the stone has interest on this point of the pathology. Remember that the only nucleus of the stone is in the opposite side of the adherent part, which shows that the adherence of the stone was not simultaneous with its origin. As between the nucleus and the adhering part of the stone there is a distance equal to two-thirds of the whole bulk of the stone, one can easily understand that the union took place very much later than the commencement of the formation of the stone.

I understand that the colloid material can have a share in the production of the adherence above all, since the influence of these materials has been demonstrated by the studies of Rainey,* of Hasting,† and of W. M. Ord.‡

We know by these experiments that the stones and their nuclei are formed by the action of colloid materials upon the salts of the urine, to which Carter has applied the term "sub-morphous." The colloid medium constitutes the stroma of the stone, but it is not visible to the naked eye. If a stone constantly rubs on any portion of the bladder, and if by the anatomical conditions of the bladder the stone is sustained near this spot, the stone may remain stuck on by means of colloid materials developed by irritation. In case that these materials become incrustated with salts, the adherence is solid and permanent. These were the attending circumstances of my patient's case.

* "Precise Directions for the Making of Artificial Calculi, with some Observations on Molecular Coalescence," by G. Rainey, *Trans. Microsc. Soc. of London*, vol. vi., 1858 and 1872.

† "On Molecular Coalescence and on the Influence exercised by Colloids upon the Forms of Inorganic Matter," *Quarterly Journ. Microsc. Soc.*, vol. xii., New Series, 1872.

‡ "The Microscopic Structure and Form of Urinary Calculi."

The child could not walk nor use his legs in any way. If to this want of movement we unite the form of the bladder in infancy, we can understand clearly that the stone was always in motion on the same spot, developing local inflammation, forming the fibrinous mucus. This state produced precipitation of phosphates, urates, and other salts, which incruited the inflamed spot, which established the immediate union between the stone and mucous membrane; the same happens here as passes in the organization of pseudo-membranes in the pleurisy.*

In no other manner can be explained this solid union of the stone without the granulations of which Keyes and Chelius speak. My idea is that, if we could have performed the operations of Carter and Ord, we should have discovered between the mucous membrane and the stone that organized material which caused the precipitation of the salts and consequently the union.

I think we can add to the theories of Chelius and Keyes the following, which serves to explain the cases where there is no granulation between the mucus and the stone.

The colloid materials accumulated in the vesical point, which is irritated by the stone, unite the stone and the mucous membrane at the same time that they precipitate the urinal salts and conglomerate them. If the union effected by the colloid holds its place while the salts are conglomerated, the definite petrified adherence is complete.

Children who have not yet begun to walk, and who are nearly always in the same posture without much movement, present more favorable conditions for a sustained contact between the stone and the mucous lining and facilitate the adherence.

Practical applications.—Two practical problems, of much interest, illustrate the case; the one diagnostic and the other therapeutic; the second is the immediate consequence of the

* Among the many autopsies that I have performed when I was physician to the Hospital of Nuestra Señora del Carmen (Madrid), I found that of an old man with a vast pleuritic effusion on the right side, the walls of which were quite ossified, for which reason, in order to extract a piece of pulmonary pleuræ, I required to use the rib-shears.

first, because, if we do not find out with a precise diagnosis all the conditions of the stone, including that of the adherence, we cannot determine which operation is to be preferred regarding an adhering stone.

(a) But few practitioners recommend seeking and ascertaining if the stone is adherent; the greater number are content with feeling that a stone exists, and *ipso facto* proceed to the operation to which they are partial. This system ought to be abandoned, and in its place such treatment should be made in order to discover whether the stone is free or adherent.

We can accumulate a great number of facts to demonstrate that there is an adherence. Dr. Candela refers in the history of his case to the fact that the catheter had scarcely entered into the bladder when he felt the roughness of the stone, and that he used forcible movements against the stone without being able to move it. I also, in my patient, stumbled against the stone when the instrument had no more than entered into the bladder. In spite of pushing with the catheter I always felt the stone in the same place.

I deduce from the case of this child that the micturition had never been interrupted, which demonstrates that the stone could not move to the entrance of the urethra, thereby closing it. Besides, another fact of importance is that the child had never had hæmaturia.

I think, then, that in a patient with vesical stone one should try to collect scrupulously the antecedents of the case; and if he has had or has not had the symptoms which I have just spoken of,—that is to say, if the patient has not had, during micturition, an interruption of the passage of the urine or hæmaturia, then there may be adherence. If there are suspicions of adherence, an antiseptic injection should be made in the bladder, and the stone can be taken hold of with a small lithotrite in order to give it ample movements; the impossibility of moving it will show that the stone is adherent.

Besides, an examination can be made with the modern endoscope, and the truth ascertained to a greater certainty than with the Desormeaux instrument.

(b) Since January, 1878, in which Bigelow * presented his

* *The American Journal of the Medical Sciences*, Lea, Phila.

modifications of the old-fashioned lithotritry, the litholapaxy appears to be the perfection of surgical art, for, without causing the least injury, it satisfies an indication which formerly was only possible by an operation perilous, as is always the perineal or suprapubic lithotomy.

But the vesical stone is not always propitious to litholapaxy, and although surgeons wish to present statistics, they cannot substitute the operation of lithotomy by that of litholapaxy.

Many circumstances and reasons render cystotomy preferable to the breaking of the stone, but none of these equal in importance the adherent stone, which is a positive counter-indication of litholapaxy.

In proof of this we have the case presented by Buckston Browne to the Clinical Society of London.* "The patient was a gentleman aged sixty-eight, seen for the first time last June, with the following history: Lithotritry had been performed five times in less than two years. The first operation was in August, 1886, the last in April, 1888. The earlier operations had given only temporary relief from very distressing symptoms, and the last one had not been followed by improvement. All the urine was passed by catheter hourly, night and day, and there was constantly recurring intense vesical spasm. . . . The history of the case, the feebleness of the patient, and the need for free drainage of the bladder determined the choice of operation, and on July 3, Mr. B. Browne opened the bladder above the pubes."

It is clearly demonstrated by this instance that litholapaxy can only be a palliative proceeding, never a radical one, against adhering vesical calculi.

While the admirers of litholapaxy cannot prevent nature producing adherent stones, in vain they may try to enforce it as an exclusive method, and in vain will be their efforts to put in the shade cystotomy. Now, with litholapaxy one can take hold of the stone in its loose part, and crack it and even reduce it to fragments, but the base will remain stuck on to the vesical mucus, and after some time the stone will acquire its former size or perhaps a still greater. Therefore it is necessary to recur to the cystotomy.

* *Lancet*, November 17, 1888, p. 966.

Is there, then, a preference to be given to one of the many methods belonging to lithotomy? The first degree of peritonitis that this child had in the hours following the operation indicate that the traction exercised upon the stone ought to produce a dragging or tearing of the peritoneum, whose injury had been the cause of the inflammation that fortunately I was able to stifle.

For this reason it is necessary to act immediately upon the calculus, and by so doing detach it from the bladder; in this manner, without damaging the peritoneum, you can extract the stone.

In this case it is necessary to have ample opening,—that is to say, that you may have at the same time room for the introduction of the forceps and the finger; in this respect the greater number of surgeons consider indisputably as superior the suprapubic to the perineal lithotomy. In treating children there is much more reason that it should be preferred. Besides, the suprapubic lithotomy conduces better to visual examination of the bladder, showing if the adhering spot requires a special treatment.

The calculus being now extracted, the next treatment is, in the cases of adhering stones, by injections of weak solutions of nitric acid, in order to prevent any grains of sand, which may remain attached to the mucous membrane, from afterwards becoming the origin of another stone. The remainder of the cure belongs to the general scale of treatment of these operations.

The considerations regarding adherent stones that I have given as accurate indication of the suprapubic lithotomy, and counter-indication of the litholapaxy, are applicable to the cases of encysted calculi, of which we have examples in the exceptional case of Murray Humphrey,* in the cases of my friends, Dr. San Martin and Dr. Pulido,† and, above all, in that presented by Fenwick to the Clinical Society of London,‡ the extraordinary circumstances of which, and its resistance to

* Thompson, *loc. cit.*, p. 624.

† *El Siglo Médico*, 1889, pp. 238, 239.

‡ *Lancet*, 1888, p. 965.

the chisel and mallet, might almost serve as the groundwork of a novel or the history of the stone-worker in the bladder.

Conclusions.—1. The clinical history of this child shows evidently that the vesical calculi can be adherent to the mucous membrane without having anything to do with the encystment.

2. It is characteristic of this case that there is no suspension of the urine; in micturition there is no hæmaturia; that there is great resistance in the extraction of the stone; that there are grains of sand which stick to the bladder after the stone is extracted; a marked cavity in the stone, as is shown in the engraving; and, finally, the commencement of peritonitis immediately after the operation.

3. The frequency of the case appears very rare, according to the statistics of seven thousand four hundred and seventy-seven cases that I have tabulated. In my opinion this rarity is due more to the indifference with which it is regarded by surgeons than to a natural cause.

4. As this phenomenon of the adherent stone is very interesting, it is necessary to open this chapter on the urinary pathology of children.

5. Notwithstanding the remote antiquity of the studies upon urinary calculi, the adherence of stone has not been spoken of until the sixteenth century, and from the beginning of this century until the present date twenty-four cases, including my own, have been registered.

6. None of the theories given to science to explain the adherence interprets fully the stone of my patient; for want of such I give the following: The colloid materials accumulated in the vesical spot, irritated by the calculus, keep united the bladder and the stone for a considerable time, long enough to form the precipitation and conglomeration of the urinal salts, resulting thus in a solid and definite adherence. Children who have not yet begun to walk favor this state of things.

7. Remembering this case, in the future surgeons ought to determine without doubt if a stone is adherent, and not be content with a simple diagnosis which does not determine this fact, because there are always means of discovering the truth.

8. Litholapaxy has in the adherent stone the greatest

counter-indication to be proclaimed the only method in the operation of calculi.

9. In order to extract an adherent stone it is necessary to perform lithotomy. The suprapubic lithotomy is preferable, because the perineal cannot avoid the violent dragging and the injury of the bladder nor of the peritoneum.

ALCALÁ STREET, MADRID, October 12, 1889.

CONGENITAL DISLOCATION OF THE SHOULDER-JOINT.—A REPORT OF TWO CASES.

BY CHARLES L. SCUDDER, M.D.,

Assistant in Clinical Surgery, Harvard University, Boston.

THE etiology and the pathology of the congenital deformity of the *foot*, commonly known as talipes equino-varus, has been pretty satisfactorily determined, and the rational treatment of this deformity in its varying degrees of severity is already established. The etiology and the pathology of congenital dislocations of the *hip*-joint are likewise determined, but the treatment is not yet, save in three or four instances, satisfactory. In congenital dislocations of the *shoulder*, on the other hand, very little progress has been made. I have to report two cases of this deformity which came recently under my observation, and which are of interest because of their extreme rarity.

CASE I.—A boy, nine years old, of Irish parentage, with a good family and personal history, is the second of four children. The mother suffered no injury during her pregnancy with this child, and was delivered manually, with ease, at full term, the head presenting. At present this boy is fairly well nourished, and a little under the average height and weight.

Attitude.—He stands as shown in the photograph. The right shoulder and right upper extremity at once attract attention. The right elbow is abducted three inches from the side, and the forearm and humerus are slightly flexed. The whole